Remarks/Arguments

Claims 1-4, 7, 8, 11, 12, 15–18, 22–24, 26–30, and 34–39 are pending and at issue in the present application, claims 21, 33, and 40 having been cancelled by this amendment.

Applicants have amended claims 15, 18, 27, 30, 36, and 39 to further define the subject matter for which protection is sought. No new matter has been added by these amendments.

Applicants respectfully traverse the rejection of the claims at issue as obvious over one or more of Coleman et al., Gorlich et al., Motomura, Noel et al., Dworak et al., and Wildmoser.

Claim 1, and claims 2–4 and 7 dependent thereon, as amended, specify a method of severing and sealing a plurality of layers of film formed of a thermoplastic material. The method includes the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film. The temperature is sufficient to melt but not to burn a thermoplastic material. The method further includes the steps of feeding the plurality of layers of the film between the heated cutting edge implement and an opposing surface and moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of film therebetween. Still further, the method includes the step of suspending any relative lateral movement between the heated cutting edge implement, the plurality of layers of film, and the opposing surface, while relatively biasing the heated cutting edge implement and the opposing surface together with the plurality of layers of film pinched therebetween. The plurality of layers of film are pinched between the cutting edge implement and the opposing surface until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the opposing surface, and seals the plurality of layers of the film together.

Claim 8, and claims 11 and 12 dependent thereon, as amended, recite a method of severing and sealing a plurality of layers of film. The method includes the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film. The temperature is sufficient to melt but not to burn a film. The method further includes the steps of feeding the plurality of layers of the

film between the heated cutting edge implement and an opposing surface and moving the heated cutting edge implement and the opposing surface relative to one another to pinch the plurality of layers of the film therebetween. The method also includes the step of relatively biasing the heated cutting edge implement and the opposing surface together with the plurality of layers of film pinched therebetween, until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers and seals the resulting severed edges.

Claim 15, and claims 16–18, and 22 dependent thereon, as amended, are directed toward an apparatus for severing and sealing a plurality of layers of film formed of a thermoplastic material. The apparatus includes a cutting edge implement that is a hot wire and a controller for regulating the temperature of the cutting edge implement. The cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material. The apparatus also includes an anvil and means for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil. Means are also provided for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of film therebetween. The apparatus also includes means for suspending any relative lateral movement between the heated cutting edge implement, the film, and the anvil, while pressing the heated cutting edge implement toward the anvil with the film pinched therebetween. The film is pinched between the cutting edge implement and the anvil until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the plurality of layers of the film together.

Claim 23, and claims 24 and 26 dependent thereon, as amended, recite a method of severing and sealing a plurality of layers of film formed of a thermoplastic material. One step in the method comprises the step of heating a cutting edge implement to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of the film. The temperature is sufficient to melt but not to burn a thermoplastic material. The method further includes the step of pinching the plurality of layers of the film between a substrate and the cutting edge implement wherein the implement is heated to the temperature

between about 600° F and about 800° F. The cutting edge implement is pressed toward the substrate with the plurality of layers of the film pinched therebetween until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the substrate, and seals the plurality of layers of the film together.

Claim 27, and claims 28–30, 34, and 35 dependent thereon, as amended, specify an apparatus for severing and sealing a plurality of layers of film formed of a thermoplastic material. The apparatus is comprised of a cutting edge implement, wherein the cutting edge implement is a hot wire with a radius of 0.025 in. The apparatus also includes a controller for regulating the temperature of the cutting edge implement. The cutting edge implement is heated to a temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material. The apparatus includes an insulating insert for supporting the heated cutting edge implement, a base member for supporting the insulating insert, and an anvil. The anvil is placed adjacent to the heated cutting edge implement on a side of the heated cutting edge implement opposite from the insulating insert and the base member. The apparatus also includes means for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil and means for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of the film therebetween. Means are also provided for suspending any relative lateral movement between the heated cutting edge implement, the film, and the anvil, while pressing the heated cutting edge implement toward the anvil with the plurality of layers of the film pinched therebetween. Relative lateral movement is suspended until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the plurality of layers of the film together.

Claim 36, and claims 37–39 dependent thereon, as amended, are directed towards an apparatus for severing and sealing a film formed of a thermoplastic material. The apparatus is comprised of a cutting edge implement that is a hot wire and a controller for regulating the temperature of the cutting edge implement. The cutting edge implement is heated to a

temperature between about 600° F and about 800° F for severing and sealing a plurality of layers of film, the temperature being sufficient to melt but not to burn a thermoplastic material. The apparatus includes an anvil and feed rollers for feeding the plurality of layers of the film between the heated cutting edge implement and the anvil. Additionally, at least one actuator is provided for moving the heated cutting edge implement and the anvil relative to one another to pinch the plurality of layers of film therebetween, and for pressing the heated cutting edge implement toward the anvil with the plurality of layers of the film pinched therebetween. The cutting edge is pressed toward the anvil until the cutting edge implement, heated to the temperature between about 600° F and about 800° F, severs the plurality of layers of the film by melting but not burning the plurality of layers, contacts the anvil, and seals the resulting severed edges.

None of the cited references discloses or suggests, either singly or in combination, a method of severing and sealing a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material, as specified by claims 1-4, 7, 8, 11, 12, 23, 24, and 26.

Further, none of the cited references discloses or suggests, either singly or in combination, an apparatus for severing and sealing a plurality of layers of film with a hot wire heated between about 600°F and about 800°F that melts but does not burn a thermoplastic material, as specified by claims 15-18, 22, and 36-39.

Still further, none of the cited references discloses or suggests, either singly or in combination, an apparatus for severing and sealing a plurality of layers of film with a hot wire having a radius of 0.025 in. that is heated between about 600°F and about 800°F and that melts but does not burn a thermoplastic material, as specified by claims 27-30, 34, and 35.

In fact, Coleman et al. describes only a method of severing and sealing a plurality of layers of film by way of a heated blade (120) that pinches webs (28, 30 and 34) against an anvil roller (122) (col. 5, lines 13–28). No temperature range is disclosed within which the blade should be heated.

Gorlich et al. discloses a method and apparatus for packaging meat utilizing non-simultaneous cutting and sealing steps of a film to a tray (col. 7, lines 22–23). Indeed, Gorlich et al. also discloses different temperature ranges for the cutting and sealing steps. In

one embodiment, a "conventional heat sealing operation" is used (col. 7, lines 18–19) to seal the film (92) to a tray (55) with a cutter (88) to cut the film. The differentiation in temperature between the sealer (86) and cutter (88) is apparent from the need to supply a coolant to the cutter so the operation of the cutter is not "adversely affected by the ambient heat within the assembly which is greatly augmented by the heat created by the sealing operation" (col. 7, lines 33–39).

In a second embodiment, Gorlich et al. utilizes the aforementioned sealer (86) and an alternate cutting system (288) that comprises a heater (302) extending along the periphery of a blade (290). A temperature range of about 600°F to 900°F, which is dependent on the material to be cut, is to be used by the cutting system (288) to cause plastic vaporization. The sealer (88) and alternate cutting system (288) utilize different temperature ranges to perform sealing and cutting steps that the present invention can perform in one simultaneous step within one temperature range. In one example, Gorlich et al. teaches that a certain plastic layer could be sufficiently softened to be sealed to other layers at a temperature of approximately 250°F, while the same plastic would have a cutting temperature of about 800°F (Col. 10, lines 7–20).

Motomura generally teaches a cutter cleaning apparatus for a filling machine. The disclosure refers to a sealer that produces a tubular packaging material formed by continuously sealing in a longitudinal direction. After the packaging material is filled, the packaging material is sealed laterally at predetermined levels. Subsequently, a cutting knife cuts the packaging material between two seal lines formed at each laterally sealed portion.

Noel et al. discloses a method and apparatus for packaging products such as food. A securing device (30) heat seals a web to a tray to enclose the contents of the package. An apparatus is also utilized to raise a portion of the web located adjacent to the sealed portion during, immediately before, or immediately after the securing step. A separate severing device (46) then cuts the web at the elevated portion by way of a conventional cutting tool or a heated cutting element (Col. 7, lines 48–55).

Dworak et al. is directed toward a method and apparatus for sealing polyethelene at high speeds. A heating element (108) moves radially into a drum slot (106) that is covered by film shields (148) to prevent direct contact between the heating element (108) and plastic film (22). A dual drum chain (78) moves a separate knife block assembly (154) into position

to perforate the center of a heat seal with serrated edges. Alternatively, a cut-off knife assembly could be used to eliminate the perforation step. Dworak et al. also teaches that the separate heating element (108) heats the film to a temperature in the range of 250°F to effectively liquefy and seal the film.

Wildmoser teaches a sealing apparatus for cutting and sealing thermoplastic sheets under tension. A heated impulse wire (40) operates to cut through thermoplastic sheets under tension that are situated between two silicone rubber sealing members (38). The heater wire (40) also supplies sufficient heat in the adjacent areas on each side of the heater wire to fuse the respective ends of the thermoplastic sheets (18a, 20a) to form a heat seal on both sides of the heater wire. Additionally, Wildmoser only discloses a temperature range of 350°F to 550°F to seal the thermoplastic sheets.

The examiner stated in an interview summary sheet dated March 3, 2004, that "[t]he heated cutting tool of Gorlich used on multiple layers of material would inherently seal the layers during the process of severing the layers." Also, the examiner contended in the Office Action dated April 27, 2004, on pages 3, 5, 6, and 8, that "it is deemed inherent that the references cited will seal the thermoplastic material without burning the thermoplastic material in the same manner as the applicant's invention because the same physical elements are met." Applicant disagrees with the examiner's characterization of the art and notes that claims 15-18, 22, 27-30, and 34-39, which are directed toward an apparatus, contain structure not found in the prior art references. Further, it is well understood that a new and useful process "includes a new use of a known process, machine, manufacture, composition of matter, or material." 35 U.S.C. § 100(b). Applicants claimed range of about 600°F to about 800°F has been used in the prior art only for the vaporization of plastics, which is known to cause wax residue to accumulate on machinery. By creating heat sufficient to melt but not burn the thermoplastic material, the cutting edge implement of the currently claimed invention uses the combination of heat and pressure to allow for severing and sealing of the thermoplastic material without the formation of any vaporization residue.

Further, because none of the prior art discloses or suggests that it would be desirable or even possible to provide an apparatus or method to seal and cut a plurality of layers of film with a cutting edge implement heated between about 600°F and about 800°F that melts but

does not burn a thermoplastic material, as specified by the claims at issue, it is evident that the claims are not obvious thereover. The prior art must disclose at least a suggestion of an incentive for the claimed combination of elements in order for a *prima facie* case of obviousness to be established. See *In re Sernaker*, 217 U.S.P.Q. 1 (Fed. Cir. 1983) and Ex *Parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985).

Still further, even if the examiner could establish a *prima facie* case of obviousness utilizing the temperature ranges of Gorlich et al. alone or in combination with any of the art cited above, "a prima facie case of obviousness can be rebutted if the applicant (1) can establish the existence of unexpected properties in the range claimed or (2) can show that the art in any material respect taught away from the claimed invention." *In re Geisler*, 116 F.3d 1465, 1469 (C.A.F.C. 1997).

One skilled in the art will realize that the prior art teaches away from the presently claimed invention. Firstly, Gorlich et al., Dworak et al., and Wildmoser teach that the sealing of thermoplastic films should be undertaken at lower temperatures than applicants are claiming. Secondly, Coleman et al., Gorlich et al., and Wildmoser teach that the severing of thermoplastic films should be undertaken at temperatures that cause vaporization of thermoplastic films. The presently claimed invention of melting but not burning at ranges typically used for burning or vaporizing thermoplastics is a significant step away from the teachings of the prior art. Under controlling Federal Circuit precedent, "proceeding contrary to the accepted wisdom of the prior art . . . is strong evidence of nonobviousness." See *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983).

It is readily apparent that the temperature ranges taught in Gorlich et al. do not read on the presently claimed range of between about 600°F and about 800°F for severing and sealing a thermoplastic film without vaporizing or burning same. Assuming *arguendo* that Gorlich et al. does teach the claimed range, the presently claimed invention is a significant step away from the teachings of the prior art. For the foregoing reasons, the obviousness rejection should be withdrawn

An early and favorable action on the merits is respectfully requested.

Respectfully submitted,

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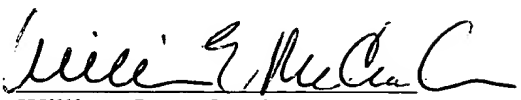
By: 
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